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NEW WESTERN EPHEMEROPTERA

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During the spring and summer of 1938 I collected Mayflies in the Sierra Nevada of California, particularly in the Mother Lode region. All the material has not been completed for publication. The Ephemerella, which were found to be most common, are to be discussed in a subsequent paper along with several other new species.

Male imagos of *Callibœtis californicus* Banks were taken at Jackson, California, April 22, 1938. A male imago of *Siphlonurus occidentalis* Eaton was taken from Dry Creek near Dry Town, California, May 30, 1938. *Rhithrogena flavianula* McDunnough, male and female imagos, were abundant on the Middle Fork of the Consumnes River in the Pi Pi Valley, Sierra Nevada (altitude 4000 ft.) on May 29, and June 5, 1938.

Among the new species collected, the following are here described: *Siphlonurus maria*, n. sp., *Ameletus amador*, n. sp., and *Paraleptophlebia placeri*, n. sp.

I wish to acknowledge the kindness of Dr. James G. Needham of Cornell University in supplying paratypes of the western species in the Cornell collection. Dr. J. McDunnough, Chief, Division of Systematic Entomology, Ottawa, Canada, has contributed material and advice which have been indispensable in this work.

Siphlonurus maria Mayo, new species

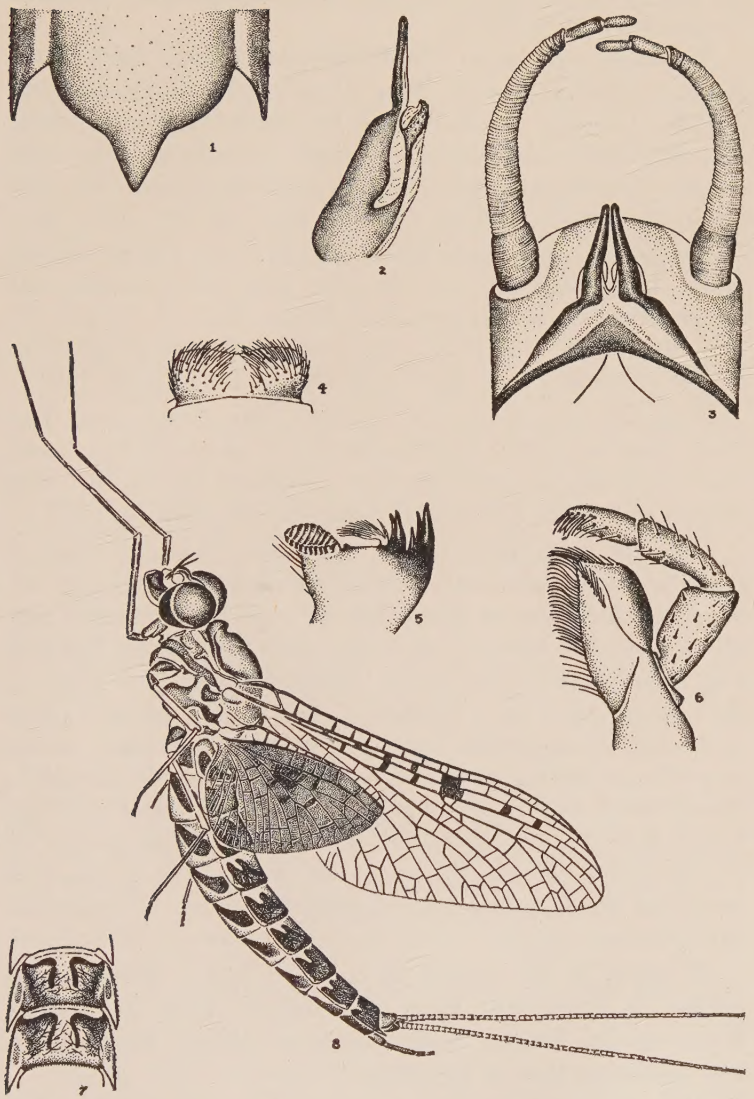
(Plate I)

Male (Figure 8). A dark, reddish-brown species. Head yellow with wide red-brown band across median carina. Basal segment of antenna light brown, pale apically. Ocelli milky white. Eyes with a white oblique band dividing the light brown portion above from the black portion below. Thorax brown; sutures tinged with olive green; posterior part of scutum yellowish near midline. Pleural sclerites reddish-brown, unsclerotized areas white. Prosternal sclerites tinged with pink; mesosternum reddish-brown; metasternum dark brown anteriorly, washed to olive. Fore legs shorter

than body, yellowish-brown. Anterior coxal sutures bright reddish-brown. Femora washed with light brown, fine dark spines along upper margins, joinings tinged with smoky gray; tibiæ with heavier spines, lighter color toward apex; tarsi faintly tinged with light brown; fine black line at apex of tarsal segments. Middle and hind femora streaked with light reddish-brown, no spines; tibiæ yellowish; tarsal segments tinged with light brown, the last segments darker. Wings as in figure 8. Hind wings coffee brown. Abdominal tergites brown, marked with dark tracheations. Segments one to seven light brown except for bright reddish-brown lateral triangles and sub-median spots which are connected to form a reddish-brown band on the posterior margin of each segment. Lateral margins and anterior triangles yellowish-white. Segments eight to ten darker; the lateral triangle on ninth segment blackish; postero-lateral spines present on tergite nine. Sternites pale yellowish-white except for the prominent reddish-brown oblique bands which are united anteriorly to form the usual U-shaped marks. Sternite nine dark reddish-brown except for small pale antero-lateral triangles. Forceps and forceps base purplish; forceps not angulate. Ventral lobes of penes smoky at tip; both lobes heavily sclerotized. Unsclerotized portions white, membranous (Figure 3). Distinct spines on dorsal lobes (Figure 2). Tails reddish-brown at base, white apically, joinings brown. Length: body 14 to 17 mm., tails 15 to 18 mm., wing 12 to 13 mm.

Female. Head yellowish; brown band across median carina. Median brown band between eyes; no oblique line across eyes as in male. Thorax as in male. Both wings with dark brown patch; in fore wing below bulla, in hind wing in radial space. Hind wing not darkened with amber as in male. Abdominal tergites more strikingly marked in female. In the living specimen the eggs give a fresh green tinge to segments one to seven. Reddish-brown lateral triangles and submedian spots as in male; on either side of mid-line are brown spots that become more prominent on tergites seven to ten, and appear as reddish-brown streaks on segments nine and ten. Segment nine with postero-lateral spines. Sternites as in male, with prominent reddish-brown U-shaped markings. Tails as in male. Sub-anal plate with a median spine (Figure 1). Length: body 15 to 20 mm., tails 15 to 20 mm., wing 14 to 17 mm.

Nymph. Mottled brown species. Thorax spotted, legs banded. Gills double on first two abdominal segments only. The pattern on tergites is bright reddish-brown (Figure 7). On fourth tergite a distinct white medial spot is conspicuous in the living specimen. Ventral pattern of the imago is prominent on sternites. The cast skin does not have the U-shaped marks, however. Mouthparts as in figures 4-6. Dark band across tails, slightly beyond middle. The male can readily be distinguished from the female by its smaller



Siphlonurus maria Mayo, new species: Figure 1, sub-anal plate of female; 2, male genitalia, dorsal view showing two lobes of penis; 3, male genitalia; 4, labrum of nymph; 5, right mandible of nymph; 6, maxilla of nymph; 7, dorsal abdominal segments seven and eight of nymph; 8, male imago.

size and by the position of the eyes which almost touch medially. Length: body 16 to 20 mm.

Holotype, male imago (in alcohol), Jesus Maria Creek, Jesus Maria, California, May 26, 1938. Altitude 1800 ft. Reared from nymph. Allotype, female imago (in alcohol), same locality, May 29, 1938. Reared from nymph. Paratypes: four male imagos, Jesus Maria Creek, May 19, 1938; Dry Creek, near Dry Town, California, altitude 1500 ft., May 12, 22, 1938; nine female imagos, Jesus Maria Creek, May 24, 1938, and Dry Creek, May 7, 10, 18, 21, June 12, 1938. Also there were fourteen male subimagos taken as follows: Jesus Maria, May 10, 15, 22, 28, 1938; Dry Creek, May 11, 12, 14, 20, 22, 1938. Five female subimagos were taken from Dry Creek, May 7, 20, June 12, 1938.

Nymphal type, male (in alcohol), Dry Creek, near Dry Town, California, May 1, 1938; female (in alcohol), Dry Creek, May 30, 1938; nymphal paratypes, eighteen specimens, Jesus Maria Creek, Jesus Maria, California, April 6, May 10, 1938.

This species is related to *S. spectabilis* Traver in type of genitalia. However, the two species may readily be distinguished. *S. spectabilis* Traver is a pale species while *maria* is dark reddish brown. The wings of *maria* are more prominently speckled than those of *spectabilis* Traver. The dark brown hind wings in the male of *maria* are a distinct contrast to the pale hind wings in the male of *spectabilis* Traver. Moreover, *maria* has a prominent oblique band across the eye, whereas the eye of *spectabilis* Traver has no such oblique band. The forceps of *maria* are much longer than those of *spectabilis* Traver; the apical margin of forceps is not concave. Spines on the dorsal lobes of penes of *maria* are larger and more prominent than those of *spectabilis* Traver.

S. maria, n. sp., cannot be confused with a third western species, *S. occidentalis* Eaton. *Occidentalis* Eaton is a large, brown species, but has hyaline wings, no oblique band on eye, and a different type of genitalia.

Only two other species, *S. marshalli* Traver, and *S. mirus* Eaton have darkened hind wings in the male. Neither of these species has the prominent abdominal markings of *maria* nor is there a similarity in genitalic structure.

Ameletus amador Mayo, new species

(Plate II)

Male (Figure 12). Head dark brown; bases of antennæ white. Ocelli white, eyes greenish in living specimen. Pronotum blackish-brown laterally, lighter along midline. Mesonotum lighter; prescutum dark brown bordered anteriorly by unsclerotized areas of bright yellow. Scutum light reddish-brown tinged with olive along sutures. Scutellum bright yellow medially, blackish-brown laterally. Scutellum of metanotum distinctly yellow medially and blackish-brown laterally. Pleuron with striking color contrasts: episternum blackish; pleural trochantin light reddish-brown; some of unsclerotized areas tinged with rose; white around spiracles and wing base. Basisternal sclerite of prosternum blackish; cervical membrane distinctly white; furcisternum deep rose. Meso- and metasterna dark brown. Fore femur purplish brown; tibia and tarsus lighter brown. Middle and hind legs yellowish; femur and tarsal joinings tinged with light reddish brown. Wings speckled; longitudinal veins reddish brown; cross veins distinct and margined with smoky brown (Figure 12). First segment of abdomen dark brown laterally; medially and along posterior margin light brown with dark ganglionic markings; segments two to six yellow with postero-lateral triangles of reddish brown, these connected by reddish brown bands in the posterior half of each segment; with a small triangular marking on either side of midline which, on segments seven to ten, is extended as a brown line almost to the anterior margin. Segments seven to ten darker; lateral triangles blackish brown. Dark tracheations prominent on all tergites. Sternite one brown; two, lighter, with a patch on either side of midline. Sternites three to six semi-hyaline. On segment three the brown patches on either side of midline near anterior margin are very much smaller than on preceding segment, and on sternites four to six they gradually become indistinct and scarcely discernible. Sternites seven to nine bright reddish brown except for semi-hyaline triangular areas on anterior lateral margins. Sternite nine blackish laterally. Forceps and forceps base reddish brown with a purple tinge. Fourth segment of forceps very light. Penes light brown. Tails dark brown basally, light distally. Length: body 12 to 13 mm., wing 11 mm., tails 14 mm.

Female. More uniformly colored than male. Head brown with dark tracheations; white around bases of antennæ; blackish brown at bases of ocelli; pale yellow around eyes with reddish brown stripe at midline between them. Thorax lighter than that of male. Prothorax reddish brown with dark tracheations. Mesonotum light brown washed with olive along sutures. Prescutum dark brown bordered with bright yellow as in male. The rounded posterior humps on the scutum dark reddish brown bordered medi-

ally by light yellow. On either side of midline in this area is a red patch. Scutellum yellow with dark tracheations; laterally not as dark as in male. Fore legs brown; tibiæ and tarsi dark brown; middle and hind legs yellowish; femora washed with light reddish brown, with several dark tracheations; tibiæ yellow, tarsi light brown. Wings speckled but not as prominently as those of male. All abdominal segments reddish brown; first segment darker; lateral triangles and posterior borders of segments reddish; all segments with dark tracheations. Sternite one reddish brown, sternites two to six lighter brown and segments seven to nine dark reddish brown. Indistinct brown patches on either side of midline near anterior margin on segments two to six. Tails dark brown basally, whitish distally. Length: body 12 mm., wing 11 mm.

Nymph (Figure 9). The nymph has prominent dark reddish brown markings dorsally. The head and thorax mottled with brown. Legs washed with brown; not banded. Abdominal tergites marked as in figure 9. Sternites one to three pale; four and five marked with a wide, brown band extending almost to the lateral margins; anterior lateral triangles pale. Sternites six and seven pale except for prominent medial spots. Sternites eight and nine largely dark brown. Sternite eight with a prominent black ganglionic area. Tails with a wide, brown band medially. Length: body, male 10 mm., tails 5 mm.; female 13 mm., tails 6 mm.

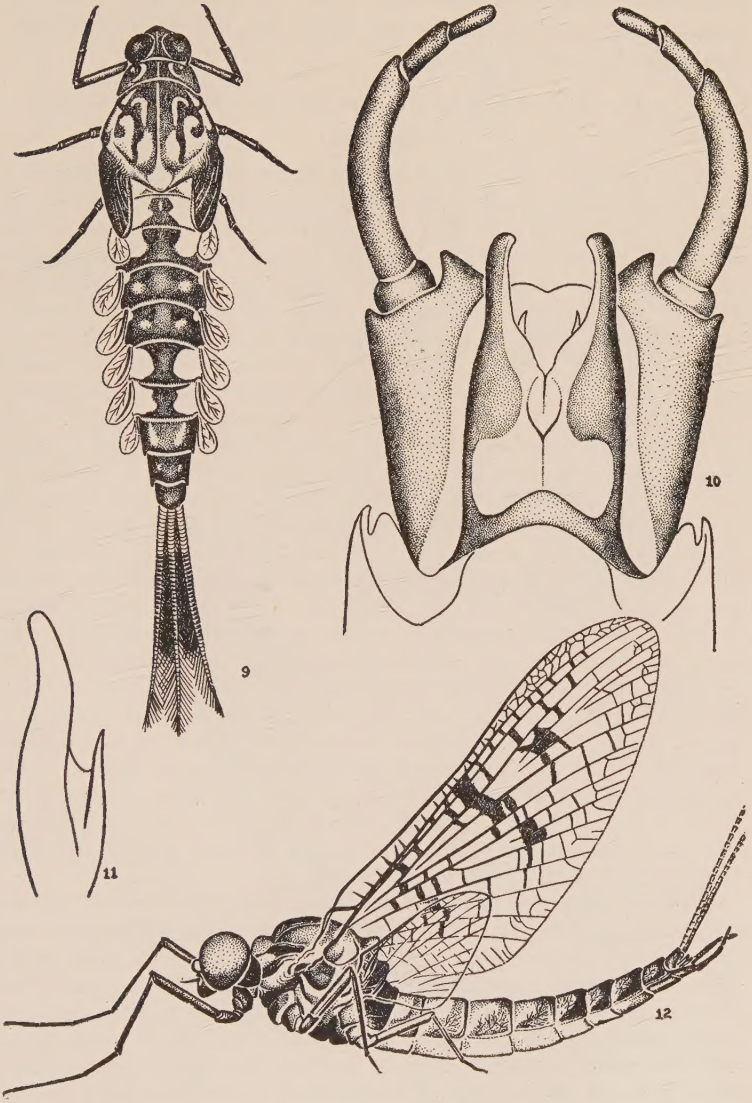
Holotype, male imago (in alcohol), Dry Creek near Dry Town, California, May 23, 1938. Reared from nymph. Allotype, female imago, same data as holotype.

Paratypes, six male imagos, Dry Creek, April 23, 1938, and May 3, 1938, and ten female imagos: Dry Creek, April 23, 1938; Dry Creek, May 5, 1938; Rancherea Creek near Amador, California May 7, 1938; American River, Sierra Nevada, altitude 4200 ft., July 26, 1938.

There were also forty-eight male subimagos and twenty-nine female subimagos taken from the same localities.

Nymphal type, male (in alcohol), Dry Creek, May 3, 1938, female same data as male, paratypes, six nymphs, Dry Creek, April 23, 1938. Cast skins from Jackson Creek, near Jackson, California, April 19, 1938; Rancherea Creek, May 5, 1938, and the American River, altitude 4200 ft., July 26, 1938.

This species is allied to *A. æquivocus* and *A. falsus* McDunnough. However, *amador* may readily be distinguished by the wings which are distinctly marked with dark patches (Figure 12). The wings of both *A. æquivocus* and *A. falsus* McD. are hyaline. *Amador* is considerably larger than either *A. æquivocus* or *A. falsus* McD. As in *æquivocus* McD., there are no dark



Ameletus amador Mayo, new species: Figure 9, mature nymph; 10, male genitalia; 11, lateral view of penis; 12, male imago.

ganglionic marks on sternites. The genitalia more nearly resemble those of *A. æquivocus* McD. but differ in structural details of the penes (Figure 10).

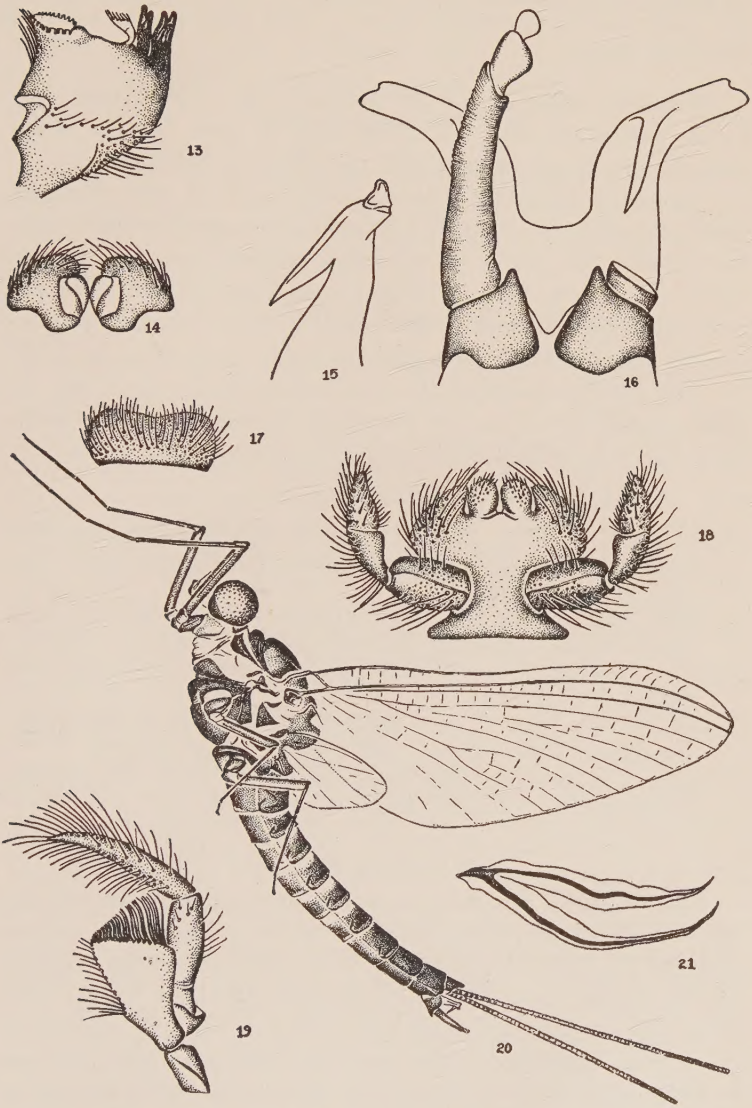
Paraleptophlebia placeri Mayo, new species

(Plate III)

Male (Figure 20). Blackish brown species. Head blackish; ocelli white, upper eyes light orange; base of antennæ yellowish brown. Median furrow and parapsidal grooves of mesoscutum deep; all thoracic sclerites blackish brown; unsclerotized areas reddish brown. Legs reddish brown at base, lighter apically. Femora deep reddish brown, fore tibiæ lighter, joinings smoky, tarsi whitish. Tibiæ of middle and hind legs washed with brown at base, whitish apically. Middle and hind tarsi tinged with light reddish brown. Wings slightly milky, particularly in stigmatic area. Longitudinal veins in costal area amber colored. Pleural wing recess dark brown. Segment one of abdomen reddish brown. Segments two to seven washed with deep brown, but distinctly semi-hyaline along anterior borders. Middle segments of abdomen therefore apparently annulate. Mid-dorsal line light brown with darker brown areas on either side. A fine black penciling along postero-lateral margins of tergites one to seven joins a distinct black oblique streak on pleural fold. Segments eight to ten dark reddish brown. Mid-ventral ganglionic areas marked with reddish brown. Basal joints of forceps reddish brown, distal joints whitish. The genitalia (figures 15-16) are somewhat similar to those of *P. californica* Traver, but there are marked differences. The penes are separated by a wide U-shaped notch. There are no projections from the penes into this notch as in *P. californica* Traver. The lateral apical processes are very long and a distinct contrast to those of *P. californica* Traver. The long reflex spur is wide at base and acute at tip. Tails light brown at base, whitish distally. Length: body 8 to 9 mm., wing 7.5 mm.

Female. More uniformly brown than male. Prothorax yellowish brown, darker laterally. Fine penciling along mid-dorsal line of pronotum. Mesoscutum reddish brown; not blackish as in male. Pleural sclerites reddish brown, unsclerotized areas yellowish brown. Legs yellowish brown. Wings slightly milky, venation more prominent than in male. Veins amber colored in costal area. All abdominal segments opaque, reddish brown. Light tracheations laterally on tergites. Tracheations surrounded by a brown granulated area which extends to the anterior margin of each tergite. As in male there is a fine black penciling along postero-lateral margins of tergites one to seven and an oblique streak on pleural fold. Tails brown at base, lighter distally. Length: body 8.5 mm., wing 8 mm.

Nymph. Brown species distinctly spotted on head, thorax and abdomen. Mouthparts as in figures 13, 14, 17-19. Lateral spines



Paraleptophlebia placeri Mayo, new species: Figure 13, right mandible of nymph; 14, hypopharynx of nymph; 15, male genitalia, reflex spur; 16, male genitalia; 17, labrum of nymph; 18, labium of nymph; 19, maxilla of nymph; 20, male imago; 21, gill of nymph.

on segments eight and nine. No branchlets on gill tracheæ (Figure 21). Legs banded with darker brown. Tails light brown. Length: body 8 to 10 mm.

Holotype, male imago (in alcohol), Dry Creek near Dry Town, California, May 12, 1938. Reared from nymph. Allotype, female imago (in alcohol), same data as holotype.

Paratypes, two male imagos, Jackson Creek near Jackson, California, May 21, 1938, and Amador Creek near Amador, California, May 28, 1938, reared from nymphs, and one female imago, Dry Creek, May 12, 1938, reared from nymph. Also one male subimago, Amador Creek, May 25, 1938; four female subimagos, Dry Creek, May 12, 1938; Amador Creek, May 29, 1938.

This species resembles *P. californicus* Traver, but may be distinguished chiefly by the annulated appearance of the abdomen, the milky wings, and the marked genitalic differences.

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An Ancient Beetle

Mr. Wayne K. Davis has recently presented me with a living specimen of *Buprestis aurulenta* L. which, with several others, emerged May 28, 1939, from a built-in sideboard on the premises of Mrs. Frank Cook, 1831 Tenth Avenue, Oakland, Calif. This sideboard was installed in the home when it was built over thirty years ago. Undoubtedly the eggs were laid some time previous to the milling of the wood and the building of the sideboard so that this beetle and its companions had spent a period of over thirty years before reaching maturity. I have known of several cases of retarded development for this same species, of from twelve to twenty years, but none quite so long as this.—Edwin C. Van Dyke.

NEW SPECIES OF ANDRENID BEES FROM CALIFORNIA

(Hymenoptera)

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The following descriptions, with one exception, are offered at this time in order that the names may be available for use by Messrs. G. E. Bohart and J. W. MacSwain in their studies of the habits of California Aculeata.

Andrena nigroclypeata Linsley, new species

Female. Robust; black; pubescence dark brownish, that of dorsum of thorax and propodeum bright fulvous. Head dull; antennæ black, obscurely brownish beneath, first segment of flagellum nearly as long as the following three segments together; face rather densely clothed with erect brownish and black hairs; foveæ broadened above and occupying at least three-fourths of space between lateral ocellus and eye, moderately broadly rounded below and extending below level of base of clypeus; clypeus dull, moderately finely, closely punctured, without a smooth median impunctate line; process of labrum broad, polished, feebly transversely rugulose, about four times as broad as long, apex about one-half as wide as base, rotundate-truncate; cheeks rather broad, subangularly rounded, densely clothed with long black or brownish hairs; malar space small. Mesoscutum dull, tessellate, moderately finely punctured, densely clothed with long, erect, bright fulvous hairs which are a little thinner on disk; tegulæ reddish, finely punctate; mesoscutellum tessellate, punctation similar to that of mesoscutum, pubescence long, erect, fulvous, dense at sides, disk subglabrous or thinly pubescent; metanotum opaque, densely clothed with erect, fulvous hairs; propodeum dull, thinly clothed with long, fulvous hairs, triangular area poorly defined, not bounded by a carina, not rugulose or carinulate; mesepisterna opaque, thinly clothed with long, erect, dark brown hairs; wings lightly infuscated, veins dark brown; legs black, clothed with dark brownish and black hairs, tibial scopa dark brown, dense, moderately compact, flocculus of posterior trochanters moderately long, curved, nearly perfect. Abdomen black, tergites one to four shining, tesselate, obscurely punctured, thinly clothed with erect, black or dark brown hairs, apex with a distinct, impressed, shiny margin; fifth tergite opaque, distinctly but not closely punctured, apical fimbria dark brown; sternites shining, sparsely punctured and subglabrous at base, distinctly punctured apically and thinly clothed with erect black hairs, apical margin fringed with a row of very long, erect black hairs. Length: 12-13 mm.

Male. Slender; black, shining; pubescence thin, black, that of thorax mostly fulvous. Head much wider than thorax; pubescence of face long, erect, black, that of occiput and ventral surface fulvous; antennæ black, first segment of flagellum less than one and one-half times as long as second; frons dull, with a polished band along eye margin; clypeus large, black, polished, finely punctured, punctures one to several widths apart, pubescence sparse, erect, black, mostly basal; process of labrum smooth, polished, about twice as wide as long, apex at least one-half as wide as base, distinctly but shallowly notched; mandibles long, slender, lying one above the other in repose; cheeks nearly right-angular; malar space short. Thorax thinly clothed with long, erect, fulvous hairs, longest on metanotum; mesoscutum, scutellum, metanotum, and propodeum dull, tessellate, punctation obscure; propodeum with triangular area poorly defined, not bounded by a carina, neither rugulose nor carinulate; wings lightly infuscated, veins brownish; legs slender, thinly clothed with long, fulvous hairs, anterior trochanters without a finger-like process. Abdomen black, shining, tergites very finely, sparsely, obscurely punctured, sparsely clothed with short, suberect, black hairs; sternites sparsely clothed with short, suberect, black hairs, posterior margins with a fringe of longer, erect, fulvous hairs. Length: 10 mm.

Male minor. Clypeus smaller, dullish, finely and very densely punctured, pubescence very dense, uniform. Length: 9 mm.

Holotype male (No. 4847, Calif. Acad. Sci., Ent.), allotype female (No. 4848), and eleven paratypes, six male and five female, from Murietta Caves, Alameda County, California, April 2, 1939, collected by G. E. Bohart and J. W. MacSwain. The females were collecting pollen from *Platystemon californicus*. Four paratypes will be retained in the collection of the writer, the remainder returned to Messrs. Bohart and MacSwain.

This fine species is related to *Andrena macrocephala* Cockerell and *A. berberidis* Cockerell but the male is easily distinguished from both by the black clypeus and shorter first flagellar segment which is at most only one and one-third times as long as the second. The female differs from *macrocephala* in its slightly larger size, darker wings and wing veins, and the shape of the process of the labrum which is short and broad with the apex rotundate-truncate rather than subtriangular with the apex feebly tuberculate. From *berberidis* the female may be separated by the fulvous notal pubescence, the broader facial foveæ, more finely punctured clypeus, and the smooth triangular area of the propodeum (in *berberidis* there are a few basal rugæ). In the struc-

ture of the head and antennæ, these three species agree rather well with the group of *A. porteræ* Cockerell (subgenus *Dactylandrena* Viereck), differing slightly in the longer facial foveæ and smaller malar space. However, in the type species of *Dactylandrena*, *A. maura* Viereck (= *A. caliginosa* Viereck), the malar space is large in the male and small in the female. The subgenus *Conandrena* Viereck was distinguished by the elongate face in the female and the absence of a finger-like process on the anterior trochanter of the male. In view of the variation in these characters between the three obviously closely related species, *porteræ* Cockerell, *caliginosa* Viereck, and *submaura* Linsley, it is doubtful if *Conandrena* can be recognized on this basis.

Andrena rhodotricha Linsley, new species

Female. Moderately robust; brown; pubescence reddish. Head dull; vertex subglabrous; frons densely clothed with long, erect, reddish hairs, occasionally with an intermixture of dark hairs above antennal bases and along sides of face; antennæ dark brown, first segment of flagellum nearly as long as following three segments together; foveæ moderately wide, broadly rounded above and occupying at least two-thirds of distance between lateral ocelli and eye, moderately narrowly rounded below and extending slightly below level of base of clypeus; clypeus dullish, moderately coarsely, closely punctured, without a well defined, median, longitudinal, impunctate line; process of labrum small, subtriangular, apex feebly tuberculate; cheeks broad, subangularly rounded, densely clothed with long, erect, reddish hairs; malar space small but distinct. Mesoscutum dull, tessellate, moderately finely, obscurely, not closely punctate, moderately densely clothed with long, fine, erect, reddish hairs which do not obscure the surface; mesoscutellum and metanotum similarly sculptured and pubescent; propodeum sparsely hairy at base, otherwise moderately densely clothed with long, erect, reddish hairs which do not obscure the surface, punctation moderately fine, sparse, obscure, triangular area impunctate, finely tessellate, mid-line rough, base with a few short rugæ; mesepisterna dull, tessellate, moderately finely, obscurely, not closely punctured, moderately densely clothed with long, erect hairs which do not obscure the surface; wings lightly infuscated, veins dark brown; legs dark brown, clothed with reddish hairs, tibial scopa short, moderately dense, hairs of dorsal margin denser, less than one-half as long as greatest width of tibia, hairs of lower margin long, recurved; flocculus of posterior trochanters long, curved, nearly perfect. Abdomen brown, dullish, tessellate, tergites one to four moderately finely, sparsely, obscurely punctured except for a narrow, paler, impressed, apical

margin, surface moderately densely clothed with long, erect, reddish hairs which do not obscure the surface; apical fimbria composed of hairs of the same color as the remaining abdominal pubescence; sternites thinly clothed with erect, reddish hairs, those of fringe along apical margin very long. Length: 11-11.5 mm.

Male. Slender; very dark brown; pubescence thin, fulvochreous. Head wider than thorax; pubescence long, erect, fulvochreous with a few dark hairs at sides of face and vertex, very dense on frons and clypeus, sparse on vertex; antennæ very dark brown, first segment of flagellum about one and one-half times as long as second, second segment shorter than third; clypeus moderately finely, densely punctured except for an ill-defined median smooth line, surface nearly obscured by the dense pubescence; process of labrum short and very broad, apex obtusely rounded; mandibles moderately long, slender, apices distinctly crossing over in repose, base with a small median tubercle, posterior margin without a basal tooth; cheeks broad, nearly right-angular, densely clothed with long, erect hairs; malar space short but distinct. Thorax thinly clothed with long, erect, fulvochreous hairs, surface tessellate, obscurely punctate; propodeum with triangular area poorly defined, not bounded by a carina, without rugæ; wings lightly infuscated, veins dark brown; legs slender, thinly clothed with long, erect, fulvochreous hairs. Abdomen dark brown, tergites tessellate, shining, finely, sparsely, obscurely punctured, sparsely clothed with erect, fulvochreous hairs, longer and denser on first tergite; sternites sparsely clothed with erect, fulvochreous hairs, posterior margin with a fringe of longer hairs. Length: 11 mm.

Holotype female (No. 4816, Calif. Acad. Sci., Ent.) and allotype male (No. 4817), from Berkeley, California, March 14, 1939, G. E. Bohart and J. W. MacSwain collectors. One paratype female, Berkeley, California, March 11, 1939 (Bohart and MacSwain) is in the collection of the writer.

Andrena rhodotricha is closely related to *A. albihirta* (Ashmead) and may prove to be merely subspecifically distinct. It differs from Colorado specimens of the latter species (including a specimen in the Timberlake collection determined by Viereck) in the reddish rather than dirty white pubescence, less coarsely punctured clypeus, and brownish veins and stigma. The male of *albihirta* was not available for comparison, but from the related *A. perarmata* Cockerell, *rhodotricha* may be separated by the brown integument, fulvochreous pubescence, and absence of the basal tooth from the mandibles.

Andrena boharti Linsley, new species

Female. Medium sized, moderately robust; dark brown; pubescence fulvous. Head dull; antennæ dark brown, first segment of flagellum about as long as following two segments together; facial pubescence moderately long, fulvous, not dense; vertex opaque, subglabrous, minutely striate; foveæ moderate, broadly rounded above and occupying a little more than one-half of the distance between lateral ocelli and eye, more narrowly rounded below and extending below level of antennal bases but not quite to level of base of clypeus, lower half paler, in some lights appearing ochreous, upper half brownish; clypeus shining, rather coarsely, closely punctured on disk, finer laterally, median smooth line poorly defined; process of labrum suboblong, nearly twice as wide as long, apex about four-fifths as wide as base, feebly emarginate or subtruncate; cheeks broadly rounded, densely clothed with long, fulvous hairs; malar space obsolete. Mesoscutum feebly shining, tessellate, disk evidently but moderately finely punctured, punctures mostly less than two puncture widths apart, pubescence erect, moderately dense, fulvous, shorter than that of pleura, not obscuring surface; mesoscutellum shining, a little less closely punctured than mesoscutum, sparsely pubescent anteriorly; metanotum densely clothed with long, erect, fulvous hairs; propodeum opaque, tessellate, obscurely punctured, thinly clothed with long, erect, fulvous hairs, triangular area poorly defined, base with a few short rugæ; mesepisterna dull, tessellate, obscurely punctured, thinly clothed with long hairs; wings subhyaline, not darker apically, veins and stigma pale brown; legs moderately slender, clothed with fulvochreous hairs, tibial scopa moderately short, not dense, hairs of dorsal margin nearly erect, not as wide as tibiæ, those of ventral margin longer, recurved at apex, minutely plumose; flocculus of posterior trochanters moderately long, thin, curved, nearly perfect. Abdomen shining, tessellate, finely, obscurely punctured, punctures averaging several puncture widths apart, tergites one to four finely, sparsely pubescent, with thin pubescent fasciæ at apices of tergites two to four, broadly interrupted on tergite two, less broadly on three, narrowly on four; apical fimbria golden brown; sternites more closely and distinctly punctured than tergites. Length: 9 mm., anterior wing, 7 mm.

Male. Slender; dark brown, shining; pubescence of dorsal surface fulvochreous, that of ventral surface perceptably paler. Head wider than thorax; pubescence of face long, erect, fulvochreous, intermixed with darker hairs near eye margins; antennæ dark brown, first segment of flagellum subequal in length to second segment, intermediate flagellar segments longer than broad; vertex and upper frons dull; clypeus shining, coarsely, closely punctured at middle, more finely toward sides, punctures less than one puncture width apart, pubescence long, pendant, dense but not

completely obscuring the surface; process of labrum about twice as wide as long, apex but little narrower than base, shallowly notched, lateral angles rounded; mandibles moderately long, slender, apices lying one above the other in repose; cheeks moderately narrow, rounded posteriorly; malar space obsolete. Thorax loosely clothed with long, erect, fulvochreous hairs, dorsal surface opaque, tessellate; propodeum with triangular area poorly defined, not rugulose or carinate; wings subhyaline, veins and stigma light brown; legs slender, thinly clothed with long, ochreous or fulvochreous hairs. Abdomen dark brown, shining; tergites one to four tessellate, obscurely, sparsely punctured, tergites two to four with a narrow pubescent fascia along posterior margin, broadly interrupted at middle on all three segments. Length: 9 mm., anterior wing, 7 mm.

Holotype female (No. 4814, Calif. Acad. Sci., Ent.), allotype male (No. 4815), and twenty-two paratypes collected at Berkeley, California, February 27, 1939, by G. E. Bohart and J. W. MacSwain. Most of the specimens were taken from their nests before emergence.

Superficially this species resembles a *Platandrena* but the form of the tibiæ will exclude it from that group. The male suggests *A.* (*P.*) *angustitarsata* Viereck and *A.* (*P.*) *opaciventris* Cockerell, but may readily be distinguished by the coarsely punctured clypeus. The female differs from *A. scurra* Viereck, to which it seems to be related, in the short, broadly bilobed process of the labrum, bicolored facial foveæ, reddish pubescence, more finely sculptured area of the propodeum, etc. In comparison with the Coloradan *A. phocata* Cockerell, which has similarly bicolored foveæ and other characters in common, it may be distinguished by the more elongate first flagellar segment (longer than the following two segments together), bilobed process of the labrum, fuscous tinted wings, and color of pubescence and apical fimbria.

Andrena (Opandrena) sphæralceæ Linsley, new species

Female. Moderate sized, robust; black, abdomen red, legs reddish brown, posterior pair dominantly reddish or rufotestaceous; pubesence thin, white. Head black; antennæ dark brown, outer flagellar segments reddish beneath, first segment of flagellum nearly as long as following three together; vertex dull, frons obliquely striate on each side of median carina; foveæ broad, pale brownish, broadly rounded above and occupying most of distance between ocelli and eye, more narrowly rounded below and extend-

ing slightly below antennal bases; clypeus moderately shining, minutely tessellate, disk subglabrous, moderately coarsely, irregularly punctured, punctures smaller, closer laterally; process of labrum short, more than twice as wide as long, apex subtruncate; cheeks rather broad, rounded posteriorly, surface polished, finely, obscurely punctured, thinly clothed with long, white hairs; malar space obsolete. Mesoscutum tessellate, dull, disk slightly shiny; surface moderately finely, distinctly punctured, punctures mostly from one to three puncture widths apart, a little sparser posteriorly; pubescence thin, very sparse on disk; tegulæ reddish brown, minutely, sparsely punctured; mesoscutellum shining, punctures similar to those of mesoscutum but less close; metanotum clothed with long, erect, white hairs; propodeum, including triangular area, dull, triangular area poorly defined, without rugæ or carinæ; wings lightly tinted with yellow, veins and stigma pale yellowish brown; legs thinly clothed with white hairs, posterior femora rufo-testaceous, apex rufo-piceous, posterior tibiæ rufo-testaceous, base rufo-piceous, spurs pale, scopa thin, loose, hairs of dorsal margin about as wide as tibia, posterior metatarsi and tarsi mostly reddish brown, flocculus of posterior trochanters long, curved, white, thin. Abdomen red, shining; tergites finely but distinctly punctured, with a rather broad, nearly impunctate, depressed, apical margin; tergites two to four with a thin, white-pubescent fascia along apical margin, broadly interrupted at middle on tergites two and three, narrowly interrupted on four; apical fimbria whitish or golden depending on the light direction; sternites with apical fringes very long, depressed, white. Length: 8-9 mm.; anterior wing, 6-6.75 mm.

Male. Moderately robust; black, abdomen red basally; pubescence white. Head wider than thorax; facial quadrangle wider than long, clypeus yellow, without lateral face marks; pubescence of face long, white, sparse; frons and vertex opaque, finely tessellate, obscurely punctate; antennæ dark brown, moderately robust, first segment of flagellum a little longer than the following two together, intermediate flagellar segments but little longer than broad; clypeus subglabrous, obscurely, sparsely punctured; process of labrum scarcely more than a narrow, transverse ridge; mandibles long, slender, apices crossing over in repose, a small notch on inner side before apex; cheeks broad, almost right-angular, polished, finely, obscurely, sparsely punctured, thinly clothed with long, white hairs; malar space obsolete. Thorax thinly clothed with long, white hairs; mesoscutum tessellate, feebly shining, moderately finely, distinctly punctured, punctures mostly about two puncture widths apart, sparser and more irregular on posterior disk; mesoscutellum shining, irregularly punctured, subglabrous; metanotum dull, clothed with long, erect, pale hairs; propodeum dull, tessellate, basal and discal areas subglabrous, triangular area scarcely defined, without carinæ or rugæ; wings tinted with yellow, veins and stigma pale yellowish brown; legs

slender, dark brown, shining, thinly clothed with white hair, apex of posterior tibiæ rufo-testaceous. Abdomen with first three segments reddish, remaining segments dark brownish; apical pubescent fasciæ of tergites two to four similar to those of female but less evident. Length: 9 mm.; anterior wing, 6.5 mm.

Holotype female, allotype male, and three female paratypes (Timberlake collection), from Salt Creek, California, March 20, 1927, on *Sphæralcea ambigua*, collected by Mr. P. H. Timberlake. Eight additional paratypes are from the Chocolate Mountains, Riverside County, California, April 4, 1937, also on *Sphæralcea ambigua* (Linsley collection). Since this species was first collected by Mr. Timberlake who recognized it as new, I have selected the type and allotype from his material, and I have also used the name suggested by him for this beautiful species.

A NEW ARIZONA PRIOCERA, WITH A KEY TO SPECIES

(Coleoptera, Cleridæ)

BY MONT A. CAZIER

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The author would like to express his thanks to Mr. P. C. Ting for notes obtained in the eastern United States, to Mr. E. S. Ross for the loan of the allotype and to Dr. E. C. Van Dyke for the use of his extensive library.

Priocera catalinæ Cazier, new species

Small, narrow, elongate; head and pronotum dark-red, elytra with basal half rufous, apical half piceous, quadrately overlapping medially, outer half of elytra piceous slightly anterior to middle, inner half rufous slightly posterior to middle, extreme posterior end of inner rufous projection yellow, small spot immediately anterior to piceous projection faintly yellow. Male. Head with front rugosely punctate laterally around eyes, sparsely clothed with rather long erect hair, occiput nearly impunctate, canthus prominent, convex; clypeus impressed, impunctate; labrum with anterior margin hairy, deeply emarginate medially; eyes separated by their own widths in front, sparsely pilose; terminal segment of labial palpi longer than basal segments, trigonate, inner edge one-half length of outer edge, upper edge widened and deeply excavated for entire length, surface rather densely pilose; antennæ rufous, eleven segmented, extending slightly beyond humeral umbone of elytra,

segments five to eleven wider than first four and shallowly serrate, segments one, three and four equal, second segment two-thirds of third. Pronotum one-half longer than wide, sides rounded and subparallel to basal third, then narrowly constricted to base, approximately one-third narrower than elytra, only slightly narrower than head (eyes included); disc sparsely punctate, punctures separated by three to four times own widths, sparsely pilose, anterior one-third with slight elevated area on either side, between and behind with short, median, narrow striation; sides rugose, sparsely pilose. Elytra narrow, about two-thirds longer than wide, sides parallel to apical sixth and then evenly rounded to apex; surface sparsely clothed with short golden pile interspersed with occasional longer golden hairs, punctures arranged in about nine even rows, extending from base to apical third and separated by about their own widths, each puncture elongate, parallel rows separated by about two and one-half times widths of punctures, apical third very minutely, sparsely punctate; scutellum small; humeral umbones impunctate, rather prominent. Beneath uniformly rufous except for piceous base on each tibia; femora clavate, those of front legs more so than middle or hind pairs, rather sparsely clothed with long and short golden pile, tibiæ rugosely punctate, faint indication of longitudinal costæ basally, tarsal claws simple; abdominal segments sparsely clothed with short golden pile, apical segment evenly rounded. Length 5.5 mm., width 1.6 mm.

Female same as male except for larger size and the more bluntly rounded apical abdominal segment. Length 7 mm., width 2 mm.

Holotype, male, in the author's collection, taken at Soldiers Camp on the ridge extending south of Mt. Lemon, Santa Catalina Mountains, Arizona, June 30, 1936, by the author. Allotype, female, No. 4818, Calif. Acad. Sci., Ent., collected at the same locality July, 1936, by Mr. E. S. Ross who generously deposits it in the collection of the California Academy of Sciences.

From the eastern *P. castanea* Newn., *catalinæ* can be distinguished by its lack of the dark band at middle of elytra and the presence of the piceous color on the apical half of the elytra. *P. catalinæ* is probably most closely associated with the California *P. lecontei* Wolcott, but differs by being narrower and smaller, more sparsely pilose, by having elytral apices piceous rather than dull orange, and by having basal half of elytra rufous rather than piceous. *P. pusilla* Kby. does not appear

to be in our fauna and, judging from the brief description, is only remotely related to *catalinæ*. From the recently described *P. chiricahuæ* Knull, *catalinæ* can at once be distinguished by its small size, rufous basal half of elytra, lack of basal yellow spot, shorter hair on legs and venter of thorax and by not having a raised area in the middle of the pronotum in front of the scutellum.

There are several species of *Priocera* from Mexico that could possibly extend into our fauna but these are distinct from *catalinæ*, according to their descriptions, as follows: *P. trinotata* Klug has the lateral elytral striæ obliterated, there are pronounced rows of punctures in *catalinæ*, *trinotata* has a basal spot that is lacking in *catalinæ*; *P. pustulata* Spin. differs by having a small basal pale spot, and by having the apex of the elytra red rather than piceous; *P. stictica* Bates differs by being larger, having the eyes approximate, by having a pale basal spot and the elytral apex yellow; *P. clavipes* Bates appears to be about the same size as *catalinæ* but has the pronotum of a pale color, a dark but interrupted fascia in the middle of the elytra and a pale apical spot preceded by a narrow arcuate fascia.

A temporary key is here given to aid future workers in determining material and it is hoped that it will serve until such time as a more fundamental key can be constructed. The descriptions of members of this genus have been very inadequate in the past and have been, for the most part, descriptions of color and elytral maculations. In all the specimens examined by the author the markings appeared to be relatively constant but it is hoped that some future worker, with adequate material, will put the classification of this genus on a more stable basis.

Key to the Species of Priocera of the United States

1. Elytra with a transverse, dark, median fascia.....*castanea*
–. Elytra without transverse, median, dark fascia..... 2
2. Elytral apices dull orange.....*lecontei*
–. Elytral apices piceous to dark brown, not differently colored than apical half of elytra..... 3
3. Basal half of elytra rufous, apical half piceous.....*catalinæ*
–. Elytra uniformly dark-brown except for three small yellow spots on basal half of elytra.....*chiricahuæ*

A NEW NORTH AMERICAN SPECIES OF ASTEIA[1]

(Diptera, Asteiidæ)

BY CURTIS W. SABROSKY

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The small family Asteiidæ in North and South America is known at the present time from little more than a dozen seldom recorded species, most of which were described in the genus *Sigalœssa* Loew. The type genus *Asteia*, which includes about two dozen Old World species, has been known from the United States only since 1915 by a single described species, *Asteia beata* Aldrich[2]. The strikingly distinct form described in the present paper adds another species to this small and uncommon genus.

Asteia multipunctata Sabrosky, new species

Slender, pale yellow species, strikingly marked with round, black spots on the ocellar tubercle, front, face, halteres and abdomen, and a variable pattern on the mesonotum.

Male. Head shining yellow, only the arista, the cephalic bristles, round spot encompassing the ocelli, and a pair of spots on the anterior third of the front, one above each antenna, black. Front shining, slightly wider than an eye (see figure). Occiput concave, a slightly infuscated spot below each pair of vertical bristles. Face moderately concave, receiving the pendant antennæ, the lower margin subrounded, projecting slightly between the vibrissæ. Eyes bare, the long axis oblique. Cheeks subequal in height to the third antennal segment and about one-fourth the vertical height of an eye. A few fine black hairs are set in punctures along the lower portion of the cheek. Vibrissal angle rounded, not produced. Oral opening longer than broad, with the prominent clypeus elongated and developed as a narrow projecting flange along the length of the opening. Palpi small, inconspicuous. Third antennal segment slightly longer than wide. Arista with four short, alternating rays on each side. Bristles long and strongly developed: one pair of inner and one of outer verticals, oral vibrissæ, and one pair of frontals, the latter erect and directed slightly outward and backward, situated close to the orbits and nearly midway on the front. One pair of proclinate divergent ocellars present, but short and

[1] Journal Article No. 359 (n.s.) from the Michigan Agricultural Experiment Station.

[2] Aldrich, J. M. 1915. New American species of Asteia and Sigalœssa. Psyche, XXII, pp. 94-98, 2 figs.

slender. A few short black hairs on the front and a longer erect black hair on each second antennal segment. A pair of short, almost indistinguishable hairs behind the ocelli and below the rim of the vertex, possibly representing the post-verticals. Thorax and scutellum yellow, the metanotum shining black and the mesonotum with variable black to reddish-black markings. Four pairs of spots and the supra-alar vittulæ black and distinct. The eight spots represent darkened areas in four indistinct mesonotal stripes (see figure). In some specimens (e. g., the holotype), the intervening areas are slightly darker, generally orange, making the stripes more evident. Only the spots are colored in paler specimens and the mesonotal striping is therefore indistinct. In either case, the posterior median spots are separate from the others. A narrow dark line extends along the lower margin of each humerus and notopleuron, and sometimes there is a slightly infuscated area on the sternopleuron. Thoracic bristles black, long: two pairs of posterior dorsocentrals, 1 + 1 notopleurals and one pair of apical scutellar bristles. One pair of short, pale subapical scutellar bristles present but very inconspicuous. Each sternopleuron bears two long, erect bristles which are easily overlooked because they are pale yellow and concolorous with the pleuron. A few pale, indistinct hairs are present on the thorax. Mesonotum distinctly longer than broad. Scutellum broad, much shorter than its basal width. Abdomen yellow, with a pattern similar to that described for *Asteia beata*. There appear to be three rows (a median and two lateral) of round black spots on the dorsum, each row composed of spots on segments two to five. There is also a spot on the lower side of segments three and four, not visible from above. Wings clear, veins yellow. The venation corresponds well with figure 3 on page 328 of Curran's manual of "The Families and Genera of North American Diptera," except that the third vein is nearly straight and the fourth vein is slightly more concave. Halteres yellow, the convex surface of the knob with a conspicuous oval black spot. Legs slender, pale yellow, with black claws. Length, 1.5-1.75 mm.

Female. The type series, though small, is sufficient to indicate a distinct sexual dimorphism in one character. In the males, the face is entirely yellow, whereas in the females, the face is marked with two round black spots which are subequal in size to the frontal spots, each situated below and partially hidden by the antennæ.

Holotype, male, Challis, Idaho, July 9, 1926 (R. W. Hægele; alt. 5280 feet). Allotype, Watson, Utah, July 27 (F. M. Carpenter; alt. 5300 feet). Paratypes: Male, same data as holotype; male, Whitehall, Montana, July 11, 1917 (H. G. Dyar); female, Kalispell, Montana, June 16, 1916 (W. H. Larrimer); male and female, Chama, New Mexico, July 18, 1929 (labeled

"*A. retroflexus*"); female, Antelope, Utah, July 1, 1931 (R. H. Beamer); female, Hope, B. C., Canada, August 1, 1931 (M. W. Sanderson). The allotype is in the Museum of Comparative Zoology, Harvard University, and the paratypes from Utah and British Columbia are in the Snow Entomological Collection at the University of Kansas. The holotype and the remaining paratypes are in the U. S. National Museum.

Fig. 1. Dorsal aspect of the head and thorax of *Asteia multipunctata* Sabrosky, new species.

The type series indicates a rather wide distribution (B. C. to N. Mex.) in the western United States, whereas *Asteia beata* Aldrich was described from Massachusetts and has since been recorded from Maine, New York, and Indiana. The latter is decidedly different in appearance, with shining black mesonotum, face with silver crossband margined above and below with black, and larger size.

The species appears to be similar to *A. elegantula* Zett., as described by Duda in his monograph of the Palæarctic Asteiidæ (Deutsch. Ent. Ztschr., Jahrgang 1927, pp. 113-147). *Elegantula* belongs to the group of species of *Asteia* which have the face crossed by a broad white band, narrowly margined above with black, whereas in *multipunctata* the face is entirely yellow in the males, and yellow with two round black spots in the females. Likewise, in *elegantula* the sternopleura and hypopleura are black spotted, and there are other differences.

A NEW SPECIES OF THRIPS FROM THE MOJAVE DESERT

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The discovery of another new species of *Dactuliothrips* makes it advisable to review the present status of the family *Melanthripidæ*. Bagnall (1913a, and 1913b) created the sub-family Melanothripinæ to include *Melanthrips* Haliday, 1836 and *Ankothrips* D. L. Crawford, 1910. In 1915 the same writer described the genus *Cranothrips* in this group. Later, in 1926, Bagnall raised this sub-family to the rank of a family including the three above-mentioned genera and the fossil genera *Eocranothrips* Bagn., *Opadothrips* Pr., and *Archankothrips* Pr. Again, in 1928 (see also Bagnall, 1930) Bagnall further elevated the Melanthripidæ to the status of a super-family and wrote that "The genus *Opadothrips* Pr. (fossil), has had to be removed to the Heterothripoidea."

Two additional genera in the Melanthrips group were described in 1931, namely, *Dorythrips* Hood and *Dactuliothrips* Moulton. Therefore, at present, there are five non-fossil genera in the Melanthripidæ as defined by Bagnall. Concerning *Dorythrips* Hood stated, "Its affinities are decidedly with *Melanthrips* Haliday, of which it is merely an elaboration." At the time Moulton described *Dactuliothrips spinosus* he erected a new family, Dactuliothripidæ, for it and placed it in the superfamily Melanthripoidea. It is true that *D. spinosus* does not have the dagger-like scoop (or flattened spurs) at the apex of the fore tibia as in *Melanthrips*, nor does it have the projected vertex as in *Dorythrips*, or basal antennal joints produced, as in *Cranothrips* and *Ankothrips*. However, in *D. spinosus*, as well as in *D. boharti* Bailey and *xerophilus* Bailey to a lesser extent (Bailey, 1937), there are two strong spines at the apex of the fore tibia. All other characters place these species in Melanthripidæ. Now, with the discovery of *D. diversus* Bailey, new species, which has two very strong spurs at the tibial apex, though not flattened to the extent exhibited in *Melanthrips*, the affinities of these two genera are well established. It is interesting to note that in *diversus* the femoral spurs are lacking. This latter character apparently does not constitute a consistently good basis for generic separation. Therefore, it seems unnecessary to retain Moulton's family Dactuliothripidæ.

With the small number of species so far described in *Dactuliothrips* it has not been necessary to use the chætotaxy of the pronotum to separate species. In *Melanthrips* this character, together with the sensory areas on antennal segments III and IV, furnish a reliable basis for species differentiation (Priesner, 1936). A study of the genus *Ankothrips* (as yet unpublished) by the writer has shown that the sensoria of the antennæ, the chætotaxy of the pronotum, together with shape of the projection of the vertex and the serrations on the second antennal segment, offer excellent specific characters. By way of further comparison, it should be mentioned that the antennal sensoria in *Dactuliothrips* show practically no variation. *Dorythrips* and *Cranothrips* are each represented by only one species, the former showing the development of a projection on the vertex, and the latter lacking the cephalic armature but exhibiting the antennal projection.

KEY TO THE FIVE KNOWN, NON-FOSSIL, GENERA OF MELANTHRIPIDÆ

1 (4) Antennæ with projections.
2 (3) Antennal segment I produced ventrally and apically as a tooth. Type of sensory areas on III and IV unknown. W. Australia.....*Cranothrips* Bagnall, 1915
3 (2) Antennal segment II produced ventrally and apically as a tooth. Sensory area on III and IV as a transverse area, varying in width, and partly or almost entirely encircling the segment near tip. South Africa, Europe, North America. .....*Ankothrips* D. L. Crawford, 1909
4 (1) Antennæ without projections.
5 (6) Head with a cephalic projection on vertex between base of antennæ. Sensoria as a narrow, transverse area encircling segments III and IV near tip. Chile, South America..... .....*Dorythrips* Hood, 1931
6 (5) Head without a cephalic projection.
7 (8) Fore tarsi without claws. Sensoria on antennal segments III and IV variable, usually as a narrow, angular line, nearly encircling the segments near tip; never as separate, oval areas. Europe, Africa, Spain, Mediterranean region..... .....*Melanthrips* Haliday, 1836
8 (7) Fore tarsi with claws. Sensoria on antennal segments III and IV as two small, oval areas on each segment, near tip. W. North America.....*Dactuliothrips* Moulton, 1931

REVISED KEY TO THE SPECIES OF DACTULIOTHRIPS

1 (4) Spurs on inner margin of fore femora absent or weak; when present, one to four in number, usually one or two. Spines on body prominent but slender.

2 (3) Fore tibiæ with two stout distal spurs (fig. 2); fore femora without spurs. Claw on fore tarsus with strong basal tooth (fig. 2). Antennæ uniformly dark brown.....*D. diversus* Bailey, n. sp.

3 (2) Fore tibiæ without distal spurs; fore femora with 1 to 4 (usually 1 or 2) weak spurs on inner margin. Claw on fore tarsus simple or with a very weak tooth near base. Third and basal three-fourths of antennal segment IV yellow, remainder brown.....*D. xerophilus* Bailey

4 (1) Spurs on inner margin of fore femora strongly developed, two to nine in number. Spines on body dense and strongly developed.

5 (6) Claw on fore tarus simple and knobbed. Fore femora with 4 to 9 spurs on inner margin. Antennæ uniformly blackish-brown.....*D. boharti* Bailey

6 (5) Claw on fore tarsus with small tooth below tip. Fore femora with 2 to 5 spurs on inner margin. Antennæ dark brown with third segment yellow.....*D. spinosus* Moulton

Dactuliothrips diversus Bailey, new species

Female: Color uniformly dark brown with faint red body pigment evident by transmitted light. Wings uniformly grayish brown with veins dark brown, including scale at base of fore wing. Hind wing nearly clear, fuscous, antennæ and legs uniformly dark brown.

Head slightly longer than wide; narrowest at base. Cheeks very slightly curved. Eyes protruding slightly. Three ocelli. Head transversely reticulate on dorsum. Mouth cone short. Antennæ slender, the two basal segments widest. Distinct annulations present on all antennal segments, faint on segment I. Two circular sensory areas on each of segments III and IV.

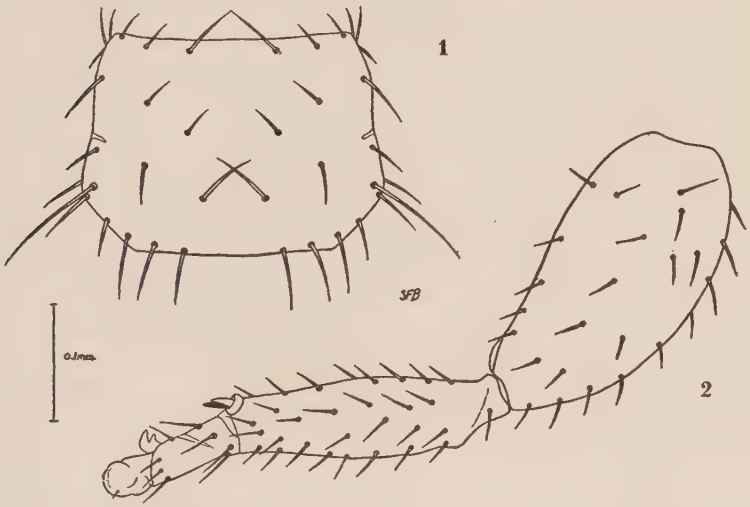
Prothorax (fig. 1) about one-third wider than long. Chætotaxy of pronotum similar to *xerophilus*. Spines not as strongly developed as in *spinosus* and *boharti*. Legs irregularly covered with spines. Fore femora thickened and without spurs. Fore tibiæ with two stout spurs at tip. Hind tibiæ with several stout spines at tip. Fore tarsi with a strong claw which has a basal tooth reaching more than half the distance to tip of claw (fig. 2). Entire surface of both wings covered with very minute setæ. Fore wing broadly rounded at tip and distinctly narrowing to base.

Fore wings with four cross veins placed as in other members of the genus. The number of regularly spaced bristles on fore vein of fore wing is from twenty to twenty-six and on the hind vein eighteen to twenty-four. Hind wing clear with a thickening on costal margin near base which supports a row of short bristles, the distal one being the longest.

Abdomen broadly ovate, tapering to tip. Dorsum of segments faintly reticulated.

Measurements of holotype: Total length of body 2.01 mm.; head, length, 0.20 mm., width, 0.18 mm.; prothorax, length, 0.18 mm., width, 0.24 mm.; mesothorax, width, 0.31 mm.; abdomen, greatest width, 0.46 mm. Length of antennal segments in mm.: I, 0.036; II, 0.049; III, 0.069; IV, 0.069; V, 0.056; VI, 0.052; VII, 0.049; VIII, 0.041; IX, 0.046; total length, 0.467. Length of spines: interocellar, 0.049 mm.; postocular (outer), 0.059 mm.; (median), 0.033 mm.; posterior-lateral marginals (pronotum), 0.092 mm.

Male: Smaller and more slender than female. Total body length of allotype 1.46 mm.



Dactuliothrips diversus Bailey, n. sp., fig. 1, pronotum, fig. 2, left fore leg (excluding coxa and trochanter).

Described from twenty-seven females and eight males collected by B. E. White on *Oenothera dentata parishii* at Hinkley (San Bernardino County), California, on April 15, 1938. Type locality, Hinkley, California. Female holotype (slide T 14) and male allotype (slide T 15) in author's collection. In addition to the type series, J. A. Downes collected two females and three males on *Oenothera contorta* and *Coreopsis*, on April 13, 1938, at Hi-Vista (near Lancaster), California.

This group of thrips appears to be limited to the desert area east of the Sierra and Siskiyou mountains. Assiduous collecting in the spring in this area, particularly in eastern Oregon and Washington and the desert areas of western North America will

doubtless bring to light additional species. The larvæ of *Dactuliothrips* are as yet unknown. Based on life history studies of other genera in the Æolothripoidea in California, this genus has all the characteristics of the cocoon spinning species thus far reared. Also, there is probably only one generation a year, correllated with the blooming of the native flowers and shrubs.

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CALIFORNIA APHIDS OF THE GENUS PHORODON

BY W. W. SAMPSON

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Genus Phorodon Passerini

Passerini, 1860, Gli Afidi, p. 27.

Head of alate forms with distinct antennal tubercles projecting somewhat inward; first antennal segment gibbous; fore wings with media twice-branched, hind wing with both media and cubitus; cornicles cylindrical; cauda nearly acutely conical, not as long as cornicles. Antennal tubercles in apterous forms with prominent projections extending forward; the first antennal segment with a projecting process. (All measurements in following descriptions in millimeters.)

Key to the Species of Phorodon

1. Cornicles cylindrical throughout, not heavily imbricated.....2
–. Cornicles constricted before tips, heavily imbricated.....*phloxæ*
2. Spur of sixth antennal segment shorter than four times base .....*humuli*
–. Spur of sixth antennal segment longer than four times base .....*menthæ*

Phorodon humuli (Schrank)

Schrank, 1801, Fauna Boica, II:110 (*Aphis*).
Swain, 1919, Univ. Calif. Pub. Ent., III:79.
Essig, 1926, Insects of Western North America, p. 254.

Apterous viviparous female. Light uniform yellowish green; cauda pale; cornicles and tibiæ dusky; antennæ dusky except base of third antennal segment. Frontal tubercles each with a finger-like process. Body 1.1 to 2.3 long; antennæ .95 to 1.05. Rostrum reaching between second and third coxæ.

Alate viviparous female. Light yellowish green, with dorsal dusky bands and lateral areas; rest of body coloration as above. Body 1.7; antennæ 1.68 to 1.85. Rostrum reaching the second coxæ. Hairs blunt on all forms.

Collections on *Prunus* species in winter and spring, on hop in summer. Rather common.

PHORODON MENTHÆ (Buckton)

Buckton, 1875, Monogr. Brit. Aphid., I:120 (*Siphonophora*).
Theobald, 1926, Aphid. Gr. Brit., I:278.
Bartholomew, 1931, Ann. Ent. Soc. Amer. XXV:727.

Apterous viviparous females. Yellow green to apple green, with darker mottlings. Cauda, cornicles, tibiæ pale; wing veins somewhat heavy. Body 1.4 to 1.7; antennæ 1.5 to 1.6. Rostrum reaching between second and third coxæ.

Alate viviparous females. Head and thorax brown; rest of coloration as above. Body length 1.5 to 1.6; antennæ 1.9 to 2.13. Rostrum reaching between second and third coxæ. Hairs blunt in both forms.

Collections on *Mentha* species, during most months of the year. Fairly common.

Phorodon phloxæ Sampson, new species

Alate viviparous female. Antennæ and head dusky; thorax black; abdomen and rest of body light apple green; dusky dorsal patches may be present on the abdomen. Tarsi and tips of the tibiæ black. Cornicles slightly yellowish to dusky, with orange patches at bases; swollen at about three-quarters the length and constricted before the tips. Wings clear, stigma dark, veins very heavy. Both cauda and cornicles may be dusky. Antennæ dusky except base of third segment. Tip of rostrum black. Hairs blunt to slightly capitate.

Length of body between 1.4 and 1.8; of antennal segments, I, .09, II, between .05 and .07, III, between .48 and .51, IV, between .30 and .34, V, .29 and .32, VI, between .74 and .80 (base, .15). Rostrum between .34 and .46 long, reaching to the tips of the second pair of coxæ. Wings between 2.47 and 2.86. Cornicles between .31 and .37; cauda between .15 and .17. Eleven to twenty secondary sensoria on antennal III, with an average of fifteen; none to six on antennal IV, generally none; none on the rest.

Apterous viviparous female. Body light apple green. Antennæ dusky to light apple green. Cauda dusky. Tips of cornicles black; a slight inflation followed by a constriction before the tips. Rest of coloration as in winged females.

Length of body between 1.5 and 1.79; of antennal segments, I, .09, II, .07, III, between .39 and .43, IV, between .26 and .27, V, between .54 and .58 (base, .12); rostrum between .36 and .48, reaching the extremities of the second pair of coxæ; cornicles between .32 and .44; cauda .17. No secondary sensoria on antennal segments. Hairs blunt to slightly capitate.

Specimens collected on the campus of the University of California from *Phlox subulata*, on March 8, 21, 23 and 28, 1938. Holotype, alate viviparous female, No. 4846, C.A.S., Ent. Paratypes, 41 slides in the collections of Professor E. O. Essig and the author.

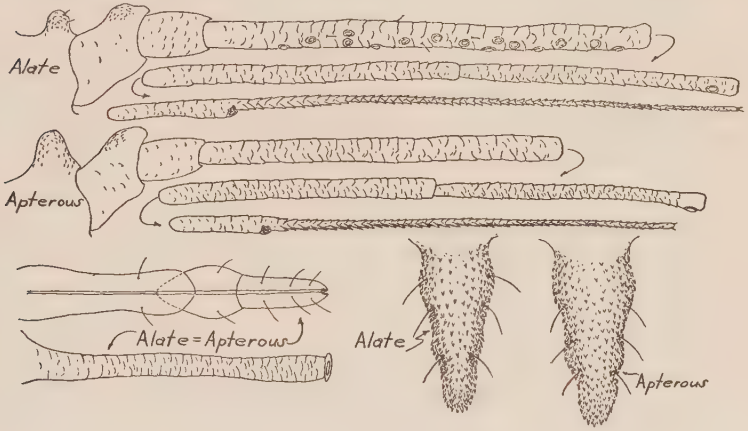

Fig. 1 *Phorodon phloxæ* Sampson

This species appears to be related in some degree to *Ph. menthæ*, from which it differs in having a smaller number of sensoria on the third and fourth antennal segments, in the shorter rostrum, and in the shape of the cornicles. The projecting process on antennal I is less strong in *Ph. phloxæ* than in *Ph. menthæ*; the projection of the frontal tubercles is also less strong.

A CONTRIBUTION TO THE KNOWLEDGE OF THE APHIDIDÆ OF NEVADA

BY E. A. DREWS

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A review of the literature reveals but few references to the aphids of Nevada. It seems that the first paper on the aphids occurring in Nevada was of an economic nature (Hillman, 1890) wherein he recorded some species found on apple. In the present paper the few previously known species are listed together with their hosts and other data, and a number of new records from the writer's personal collecting, particularly from western Nevada, have been added. Genera and species are alphabetically arranged.

Judging from published records and personal observation it would appear that species of this family are less abundant in Nevada than in other states.

Aphis cardui Linn. Dayton, Nevada, May 31, 1938. Collected on thistle, mostly on the tip of the plant.

Aphis filifoliæ Gillette and Palmer. Holbrook, Nevada, October 13, 1938. Taken on *Artemesia tridentata* sparingly. Attended by ants.

Aphis hilechrysi Kalt. Recorded from Nevada by Essig (p. 236 1926).

Aphis incognita Hottes and Frison. Holbrook, Nevada, August 1938. Taken on *Symphoricarpos rotundifolius.*

Aphis pomi DeGeer. Recorded from Nevada on apple as *Aphis mali* by Hillman (1890).

Aphis rosea (Baker). Recorded from Nevada on apple as *Aphis malifoliae* by Hillman (1890).

Amphorophora nervata (Gillette). Idlewild Park, Reno, Nevada, May 20, 1938. Abundant on cultivated rose. Taken later on wild rose, Holbrook, Nevada, May 31, 1938.

Brevicoryne brassicæ Linn. Recorded on cabbage by Hillman (1897) as *Aphis brassicæ.* Also collected by the author about 15 miles south of Yerington, Nevada, along the West Walker River, September 26, 1938, on *Cleome lutea.*

Capitophorus ribis (Linnaeus). Recorded on currant by Hillman (1897). Collected by the writer approximately 15 miles south of Yerington, Nevada, along the West Walker River, September 26, 1938, on *Ribis aureum.* Males present.

Capitophorus rosæ (Linnaeus). Holbrook, Nevada. May 31, 1938. On wild rose.

Cinara edulis (Wilson). Taken near Gardnerville, Nevada, October 13, 1938. On one tree observed, eggs were so abundant upon the needles that the tree appeared black rather than green.

Clavigerus bicolor (Oestlund). Collected on willow at Holbrook, Nevada, May 31, 1938. Not common.

Clavigerus smithiæ (Monell). Collected at Idlewild Park, Reno, Nevada, May 20, 1938. Not plentiful on the stems of willow.

Eriosoma lanigerum (Hausemann). Recorded from apple by Hillman (1890) (1892) as *Schizoneura lanigerum*. Also collected by the writer on the Highway Building Grounds, Carson City, Nevada, June 1938, on elm.

Essigella californica (Essig). Found near Minden, Nevada, June 1937, on pinon pine. Not common.

Euceraphis gillettei (Davidson). Collected at Spooner, Nevada, June 1938, on *Alnus* sp.

Fullawaya saliciradicis Essig. Found at Holbrook, Nevada, May 31, 1938, on the base of willow. Attended by a large red ant which placed a considerable quantity of soil, leaves and other material about the aphids, covering them completely. Insofar as is now known this is the third collection of this species, previous records being from Colorado. Apterous forms only.

Lachnus rosæ Cholodkovsky. Collected along the West Walker River near Yerington, Nevada, September 26, 1938. Abundant but very spotted in distribution on wild rose.

Lachnus salignus (Gmelin). Collected at Wellington, Nevada, along the West Walker River, September 26, 1938, on *Salix* sp.

Macrosiphum atripes Gillette and Palmer. Taken at Holbrook, Nevada, October 13, 1938, on *Aster canescens*.

Macrosiphum creelii Davis. Recorded from Lovelock and Fernley, Nevada, by Davis (1914). Host: Alfalfa.

Macrosiphum pisi (Kaltenbach). Recorded from Minden and Fallon, Nevada, as *Illinois pisi* by the Nevada Agricultural Experiment Station (1934). On alfalfa.

Macrosiphum rosæ (Linn.). Recorded by Hillman (1897) as *Aphis* sp. on rose. This is undoubtedly the species Hillman meant from the description he gave. Also collected by the writer at Idlewild Park, Reno, Nevada, May 20, 1938, on cultivated roses and at Holbrook, Nevada, May 31, 1938, on wild rose.

Macrosiphum solanifolii (Ashmead). Collected at Holbrook, Nevada, May 31, 1938. Abundant on the tips of nettle. Also collected sparingly on Honey Locust, Carson City, Nevada, June 1938.

Mordwilkoja vagabunda (Walsh). Recorded from Nevada by Essig (p. 259, 1926). Hosts listed are poplar, aspen and cottonwood.

Myzocallis ulmifolii (Monell). Taken on the grounds of the old U. S. Mint Building, Carson City, Nevada, June 1938. Very abundant on Elm.

Myzus cerasi (Fabricius). Recorded from Nevada by Essig (p. 251, 1926), on Sweet Cherry.

Myzus persicæ (Sulzer). Taken near Yerington, Nevada, September 26, 1938, on *Cleome lutea.*

Pemphigus populi-transversus Riley. Recorded by Hillman (1897) as *Pemphigus* sp. on poplar. Collected by the writer along U. S. Highway 50, Lake Tahoe, Nevada, July 1937, and at Lake Topaz, Nevada, June 1938, on poplar.

Rhopalosiphum prunifoliæ (Fitch). Recorded from Nevada on apple by Hillman (1897) as *Aphis prunifoliæ.* Collected by the author in Idlewild Park, Reno, Nevada, May 20, 1938, on the same host.

Tamalia coweni (Cockerell). Recorded from Nevada by Essig (p. 231, 1926), on manzanita.

Toxoptera graminum (Rondani). Recorded from eastern central Nevada by Webster and Phillips (1912) on wheat.

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TWO NEW SPECIES OF ACMÆODERA FROM CALIFORNIA

(Coleoptera, Buprestidæ)

BY P. H. TIMBERLAKE

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Acmæodera perlanosa Timberlake, new species

A member of the trisinuate group, closely allied to *A. fenyesi* Fall, but differing in being usually immaculate and in having a denser and longer, almost entirely dull white woolly pubescence.

Moderately robust, subdepressed, black, rather feebly bronzed. Pronotum and elytra immaculate. Clothed above and beneath with unusually long, dense, somewhat curly, dull white hair, with only a few fuscous hairs intermixed at the base of elytra, on anterior part of pronotum and on the frons. Head closely punctured, the carina on vertex feeble. Clypeal margin weakly emarginate. Antennæ serrate beginning with the fifth joint. Pronotum about twice as wide as long, subtruncate at apex. Sides slightly converging from base to middle, then rounded to apex (not subdilated before the base, as is often the case in *fenyesi*). Apical angles subacute. Side margins distinct throughout, but not visible from above. Disk weakly impressed medially, moderately impressed on each side, the lateral impressions sometimes ending in a weak fovea near base. Punctures of pronotum moderately fine and close on middle of disk, becoming dense and coarser at the sides. (Puncturation on middle of disk a little closer and finer than in *fenyesi*). Elytra subdepressed, as wide at base as prothorax. Sides of elytra feebly converging from base for two-thirds of the length, then more rapidly and arcuately to the rounded apex. Lateral margins of apical half rather finely serrate. Umbone moderate. Striæ, punctures and intervals of elytra as in *fenyesi*. Under surface moderately closely, rather finely punctured like *fenyesi*, the punctures becoming much coarser on sides of the first ventrite toward the base. Under surface of pronotum coarsely punctured. Anterior margin of prosternum with two distinct blunt cusps. Crest of last ventrite rounded or subangulate. Length, 9-9.5 mm., width, 3.5-3.7 mm.

Holotype male and three paratypes (sex uncertain), taken on *Eriodictyon crassifolium*, Andreas Canyon, near Palm Springs, California, April 24, 1932 (Timberlake), in collection of the

Citrus Experiment Station; two paratypes in collection of the California Academy of Sciences, one from Paraiso Springs, California, May 15, 1912 (L. S. Slevin), the other from Palm Springs, in April (A. Fenyes). Also twenty-seven paratypes from Sunset Valley, Santa Barbara County, on *Eriodictyon traskiæ*, July 4, 1938 (B. E. White), in the collection of Mr. White.

The paratype from Paraiso Springs has the punctures of the pronotum like *fenyesi*, and the Fenyes specimen from Palm Springs has three marginal reddish dots on each elytron.

Acmæodera fenyesi Fall

This species is moderately common at Riverside and is found most frequently on *Lotus scoparius*, which I presume may be the food plant.

Acmæodera jocosa Fall

A. jocosa is one of the rarer species of Southern California. Personally I have taken only three specimens, at Lytle Creek Wash and near Devore, San Bernardino County, June 6 and 23, at flowers of *Adenostoma fasciculatum*. These have been compared with the series in the Academy collection at San Francisco. In rearranging my collection I noted these unexpected characters in *jocosa*: Under surface of thorax and abdomen with long, dense, white hairs, fully as conspicuous as in *A. fenyesi*. Antennæ widened beginning with the fourth joint. In the male the fourth joint is triangularly widened from the base, being fully twice as wide as the third joint, but hardly more than two-thirds as wide as the fifth, which like the following joints is strongly serrate. The surface of the dilated joints is dull and very minutely and densely punctulate. In the female the antennæ are much less dilated and serrate, with the surface of the joints rather shiny and not distinctly punctulate. The fourth joint widens toward the apex, where it is distinctly wider than the third, but considerably narrower than the fifth. The antennæ of *jocosa* are remarkably similar to those of *A. cribricollis* Horn and *A. larreæ* Fall, and the occurrence of such a structure in a member of the trisinuate group is decidedly novel.

Acmæodera palmarum Timberlake, new species

This is a small, densely squamose species, allied to *A. gemina* Horn and *A. insignis* Horn in general structure, but having the antennæ abruptly widened after the fourth joint. From other more or less squamose species, with similar antennæ, such as *A. varipilis* Van Dyke and *A. junki* Thery (*squamosa* Van Dyke), it differs in the very small size, weakly emarginate clypeus and entire lack of side margins on the prothorax. Only the male is known, and the female possibly may have the long silky hair on terminal segments of venter as in *junki*. This, however, may not prove to be the case, as the difference in general structure and in the type of squamiform pubescence may indicate that it belongs in a little group of its own.

Male. Small, subcylindrical, with the general form and structure of *gemina*. Head, prothorax and under surface bronzed black. Elytra a light testaceous yellow tinged with brown (pale tan color), agreeing with the light color in *gemina*. Umbones dark, slightly bronzed. Outer margin of elytra very narrowly darkened, especially in apical half, with brown or blackish. Elytra otherwise immaculate, although the brown shading is slightly intensified in certain small areas. Head closely punctured, the sculpture concealed by pubescence. Anterior margin of clypeus broadly arcuate, very weakly emarginate. Antennæ serrate beginning with the fifth joint. Pronotum not quite twice as wide as long, strongly convex and unicolorus. Apex barely narrower than the subtruncate base, with the anterior margin broadly arcuate and produced moderately in middle over head. Disk widest somewhat behind the middle, the sides being strongly arcuate. Both anterior and posterior corners broadly rounded, and side margins entirely obliterated. Surface shining, entirely without median impression or lateral foveæ and coarsely punctured, the punctures dense at sides, slightly separated in middle, and not at all cribrate. Elytra at humeri slightly narrower than widest part of thorax, narrowed between humeri and middle, and arcuately narrowed in apical third to rounded apex. Margins finely serrate behind the middle and more coarsely at apex. Surface very convex, the lateral margins visible only apically in dorsal view. Striæ all similar, hardly impressed, very coarsely punctured, the punctures mostly about one-half their diameter apart (some contiguous, others fully a diameter apart, the contiguous ones mostly in the fifth and sixth striæ). Intervals all very narrow, slightly convex, uniseriately and minutely punctate. Anterior margin of prosternum arcuately retracted, practically as in *gemina*. Apical

segment of venter simple at apex. Sculpture of under surface almost entirely concealed by the dense squamiform pubescence, but is about as follows as seen through slight abrasions: Prosternum and under surface of pronotum coarsely punctured. First ventrite rather coarsely and closely punctured, the following segments apparently very finely and densely punctured. Pubescence white, squamiform, appressed and very dense on entire under surface and on femora, frons and sides of the pronotum broadly. Squamæ about as broad as long, except on the frons where they are considerably longer than wide. Squamæ on the sides of pronotum and in a narrow strip across basal margin are broad, otherwise they gradually change into coarse flattened appressed setæ, which cover the middle half of disk, those on sides being directed inward. Setæ of elytra all set in the fine punctures of the intervals, in the form of scales consierably longer than wide, not appressed, but bent over from the base and directed backward, those on and near the umbones becoming broader and appressed. Length, 4.5 mm., width, 1.4 mm.

Described from one male (holotype) in collection of the Citrus Experiment Station, taken June 8, 1930, five miles south of Palm Springs, California (Timberlake).

The specimen was found on *Dicoria canescens*, but as the day was extremely hot it may have been merely resting in the shade, along with many Hymenoptera and other kinds of insects.

Acmæodera insignis Horn

I have one specimen of this species collected June 8, 1930, six miles south of Palm Springs, California. It was swept from *Eriogonum trichopes*. *Insignis* was described from Lower California and has been recorded from Arizona, but this is, I believe, the first definite record from California.

Pachybrachys hybridus Suffr. as a Pest of Heather

(Coleoptera, Chrysomelidæ)

Specimens of *Pachybrachys hybridus* Suffr. identified by Mr. B. E. White were collected at San Carlos, California, on May 30, 1939, where they were observed doing serious damage to the growing tips of young heather plants. Many of the tender tips had been eaten half way through and had wilted or fallen over.—P. C. Ting.

A NEW ANGITIA, PARASITIC ON THE ARTICHOKE PLUME-MOTH

(Hymenoptera, Ichneumonidæ)

BY R. A. CUSHMAN

U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine.

The following description is published at this time in order to make the name available for a projected paper on the host insect, an important pest of artichoke, *Cirsium edule*, in California.

Angitia platyptiliæ Cushman, new species

Distinguished at once from *Angitia pterophori* (Ashm.), another western species parasitic on pterophorid larvæ, by its much broader temples, black front and middle coxæ, and almost entirely ferruginous, exannulate hind tibia.

Female. Length 7.0 mm., antenna 4.5 mm., ovipositor sheath 2.0 mm.

Head very finely punctate and mat, in dorsal view transversely suboblong, about twice as broad as greatest thickness; temples extending straight back for most of their length; occiput rather deeply concave; eyes not bulging, parallel and only very faintly emarginate within; face twice as broad as long; clypeus shining, more sparsely and coarsely punctate than face, and more definitely separated from face than usual, with faint indication of a median tooth; malar space nearly as long as basal width of mandible; antenna with about 30 joints, flagellum rather stout, tapering toward apex, basal joint about three times as long as thick, apical ten or more joints submoniliform, each about as thick as long. Thorax stout, fully two-thirds as deep as long, with dense, short pubescence, mostly finely alutaceous and mat; pronotum longitudinally striate in impression; mesoscutum very finely punctate, notaulices faintly indicated; scutellum shining, sparsely punctate; pleura more coarsely punctate and more shining than mesoscutum, speculum polished, sternaulix indicated, set off laterally by a slightly elevated, more shining area next to prepectus; sternum subpolished; propodeum punctate basally and laterally, petiolar area transversely rugulose, all the usual carinæ except basal very strong, costulæ more or less evident, areola broadly pentagonal, petiolar area weakly concave. Legs rather stout; inner hind calcarium more than half as long as basitarsus, which is about as long as combined lengths of joints two to four, claws pectinate basally. Wings: Areolet small, oblique, petiolate, postnervulus

broken at about middle; abscissula as long as intercubitella. Abdomen slender, minutely alutaceous and mat; petiolar fossæ distinct though not very deep; tergite two nearly twice as long as its basal width; ovipositor strongly recurved, sheath fully a half longer than first tergite.

Black, this color embracing antennæ, all coxæ, and basal joints of middle and hind trochanters; mandibles, palpi, and legs ferruginous, extreme apex of hind tibia, hind tarsus largely, and other tarsi apically fuscous; tegulæ yellow; wings hyaline, stigma fuscous, veins black, costa pale.

Male. Essentially like female.

Host. *Platyptilia carduidactyla* (Riley).

Type locality. Half Moon Bay, California.

Holotype, allotype, and paratypes, No. 53340, U. S. National Museum and paratypes, California Academy of Sciences and Canadian National Collection.

Described from 19 females and 15 males, all reared by W. Harry Lange. The holotype, allotype, and eight paratypes emerged November 2, 1936; other specimens from the type locality were reared at various dates in December, 1935; August, September, and October, 1936; and May, 1937; while others from Pescadera, Princeton, and Santa Cruz, Calif., were reared in June and July, 1936.

The only variation of note is in size (5-7 mm.) and in the strength of the costulæ.

I have been unable to identify this species as any of those included by Viereck in *Angitia* or in any of the closely related genera or subgenera. That author's "A Preliminary Revision of the Campopleginæ in the Canadian National Collection, Ottawa," which appeared serially in the Canadian Entomologist during the years 1925 and 1926, fell far short of clarifying the group of which it treats. Many of the characters that he used in keying out the genera and subgenera are not dependable, and in some cases Viereck himself did not follow them in placing species. For example, several of the species which he correctly placed in *Angitia* will not run to that subgenus in his key because the second abscissa of the discoidal vein is fully as long as the third; while he placed his own *Idechthis pœnerivalis*, an *Angitia* with distinct petiolar fossæ, in *Ischnoscopus*, in which, according to his key, the fossæ are lacking. The last statement is based on my own examination of the type of *pœnerivalis*.

ANGITIA PÆNERIVALIS (Viereck) Cushman, new combination

Idechthis pænerivalis Viereck, 1906. Trans. Am. Ent. Soc. 32:216.

Campoplex (*Ischnoscopus*) *pænerivalis* Viereck, 1925. Can. Ent. 57:223; 1926, 58:199.

ANIMAL ECOLOGY

Problems of Animal Ecology. F. S. Bodenheimer. London: Oxford Press, 1938, pp. vi + 183, 28 figs. $4.00.

As the author warns us in his preface, this book is "no easy reading." Within its slender covers, Professor Bodenheimer, the eminent Palestinian entomologist, takes us through many short but thought-provoking excursions into little-known fields of the zoological sciences, particularly entomology. The approach is essentially mathematical and any such attempt to place the complex interrelationships of living things on an exact basis is certain to be met with dissension. For instance, one may question his rigid application of the climograph for estimation of the numerical development of insects or the statistical analysis of the question of longevity.

The author must be given credit for presenting frankly and succintly his views on such highly controversial subjects as Lamarckism, the animal community and biological equilibrium. He reiterates his stand on biological control, calling for a more rigid examination of the available facts and for further data on the determining factors of successful parasitism. He further pleads for an unprejudiced approach to the problem of environment versus heredity and points the way for a reexamination of Lamarckian theory.

"Problems of Animal Ecology" is recommended for all those entomologists who believe that ecology is more than readings in nature study. Its style is rather terse and many figures and statements suffer from lack of elucidation. A more thorough elaboration would have been welcome.—N. Stahler.

REMARKS ON THE GENUS ELASMOSTETHUS IN NORTH AMERICA

(Hemiptera, Pentatomidæ)

BY J. R. DE LA TORRE-BUENO

Tucson, Arizona

Up to 1904, when E. P. Van Duzee published his "Annotated List of the Pentatomidæ Recorded from America North of Mexico" (Trans. Amer. Ent. Soc., XXX:1-80), there was known only one species, *Elasmostethus* (then termed *Acanthosoma*) *cruciatus* Say. In this paper, Van Duzee described one species, *atricornis*, and var. *cooleyi* of *cruciatus* Say.

There our knowledge of the American species of *Elasmostethus* rested until 1932, when H. G. Barber in his paper "Two Palearctic Hemiptera in the Nearctic Fauna" (Proc. Ent. Soc. Wash. XXXIV:65-66) synonymized Van Duzee's var. *cooleyi* with *E. interstinctus* Linné, based on specimens from the Mackensie Delta received by J. R. Malloch from Owen Bryant. I have seen these specimens.

Van Duzee gives very little, other than color, to distinguish his variety, the structural characters falling within the limits of variability of *cruciatus*. There are in my collection two male specimens from Bryant named "var. *cooleyi*" by Barber. These answer to Van Duzee's characterization. There are also two females from the lot from Aklavik, identified as *E. interstinctus* by Barber and Malloch. This determination I have checked in the light of the European keys and descriptions (Fieber, Lameere, Saunders, etc) and by comparison with authoritatively determined European specimens (England, Bohemia, Spain). There are elusive differences, but the male genital segment in the American and the European specimens (by Barber's drawing) and the female segment from specimens from both regions are indistinguishable from each other in either sex, as between specimens. All, European and American, have the "row of black spots on either side of the venter, midway on segments 2 to 6" as stated by Barber.

However, the two specimens determined by Barber as "var. *cooleyi* V.D." have no such rows of black spots, but they agree with Van Duzee's description, *in which no mention is made of ventral black spots*. Now, since the characterization of the variety is but a *meticulous* color description, it is impossible that such a conspicuous color character should be overlooked;

in fact, Van Duzee categorically states: "Beneath pale yellowish *immaculate*" (Italics mine). Consequently, *Elasmostethus cruciatus* Say var. *cooleyi* Van Duzee clearly cannot be *E. interstinctus* L., and it stands as a smaller color variety as described.

On the other hand, *E. interstinctus* is obviously correctly interpreted and is found in America, as recorded.

The following brief key brings out the differences among the three North American species.

Key to Species of Elasmostethus

1. Antennæ piceous or shining black with the incisures pale (pronotal punctures fine, concolorous on the anterior part of the pronotum and a dark narrow series posteriorly); length, 9-10 mm., width, 5-5.5 mm.....*atricornis* V.D.
–. Antennæ pale, except for the more or less darker apical segment 2
2. Pronotal punctures coarse, almost like foveoles, widely separated; venter *without* lateral rows of black spots, from ventral segment II to VI; length, 7-11 mm., width, 4.9-6 mm.....*cruciatus* Say (and var. *cooleyi* V.D.)
–. Pronotal punctures small, punctiform, fairly close together; ventral segments II to VI each with a lateral black spot on each side; length, 10.6 mm., width, 4.9 mm.....*interstinctus* Linné

Van Dyke Retirement

After twenty-five years of service with the University of California, Dr. Edwin Cooper Van Dyke retired on June 30, 1939, at the age of seventy years. As a tribute to his years of service as teacher, counselor, philosopher, and friend, a group of one hundred and twenty-five associates gathered at a banquet on Saturday evening, April 29, 1939, at the International House in Berkeley. Dr. W. B. Herms, chief of the division, presided as toastmaster and introduced the following speakers: Dr. S. B. Freeborn, Dr. R. C. Miller, Prof. E. O. Essig, Dr. J. H. Keen, Dr. E. G. Linsley, Mr. H. H. Keifer, and Mr. E. S. Ross. A bound volume of letters and telegrams received from hundreds of friends, far and near, was presented to Dr. Van Dyke and a silver bowl was presented to Mrs. Van Dyke.

Dr. Van Dyke retires as a true entomologist, molting into an instar of even greater activity and productivity unfettered by official duties. His library follows his collection to the California Academy of Sciences where he will carry on his work in the future. For the present and during the next year, however, Dr. and Mrs. Van Dyke are taking a long-anticipated field trip through the south Atlantic states.—R. L. Usinger.

A NEW COLLETES (HYMENOPTERA, APOIDEA) FOUND ON SANTA CATALINA ISLAND

BY T. D. A. COCKERELL

Boulder, Colorado

Last year my wife and I collected a species of *Colletes* in some abundance at various places and on various flowers on Catalina Island. On comparing it with the collection at the Citrus Experiment Station, it was found to be *C. eriogoni*, which Timberlake had collected on the mainland, and had named in manuscript. Mr. Timberlake very kindly permits me to describe it, as it is an important member of the island bee-fauna. The pubescence varies in color; specimens taken late in the season (September 1) being pale, apparently bleached, and I thought at first there might be two species, but the characteristic abdominal structures are the same.

Colletes eriogoni (Timberlake MS.) Cockerell, new species

♂. (Type). Length about 10 mm.; slender, black, with bright fulvous pubescence, with no dark hairs intermixed; abdomen with five entire bands of tomentum, that on first tergite narrower than that on second; head broad, eyes strongly converging below; mandibles faintly brownish at tip; antennæ black, the flagellum long, reaching scutellum; malar space nearly as long as broad; posterior disc of mesonotum and anterior part of scutellum shining; tegulæ dark brown; wings hyaline, stigma and nervures brown; legs black; first tergite with small inconspicuous punctures. Lobes of eighth ventral plate very large and broad, of the general style of *C. scopiventer* Swenk, with no lateral process, the apical part broader than in *C. scopiventer*, conspicuously ciliate on the margin, and the inner face near the base conspicuously fimbriate. Volsella dark, bilobed, the lobes minutely denticulate on inner face. Stipites with the apical portion flattened, very slender in one view, strongly fringed at base and along sides as well as at apex, somewhat in the style of *C. spectabilis* Morawitz. Sagittæ strap-shaped, strongly curved, truncate, rather in the style of *C. cinerascens* Morawitz, but with very long hairs on the concave side. Apical lobe of eighth ventral plate broadened, dark, hairy. Sixth ventral plate with conspicuous lateral tufts of hair on tubercles, rather as in *C. daviesanus* Smith.

♀. Length about 10.2 mm., anterior wing 7 mm.; black, with pale ochreous-tinted pubescence, dense and rather brightly colored on thorax above, with no dark hairs; antennæ black; mandibles very faintly brownish at apex; head broad, clypeus exposed,

glistening, coarsely striate; malar space fully twice as broad as long; mesonotum mainly dull, but posterior disc shining, with sparse large punctures; scutellum shining anteriorly; base of metathorax with the transverse plicæ well spaced; tegulæ small, very dark brown; wings hyaline, nervures and stigma dark brown; legs black, hind tarsi with very long hairs posteriorly; abdomen shining on first two tergites, duller and very minutely punctured beyond; tergites one to five with broad apical bands of ochreous-tinted tomentum; the band on first is narrow, but looks broad because it is contiguous with a broad band at base of second tergite.

The type has the genitalia extended, but for more minute study I boiled up part of the abdomen of a male from Fisherman's Cove, on *Calochortus*, and mounted the parts in balsam. The type (male) is from San Bernardino Mountains, California, 7000 feet on trail to the Dobbs cabin, August 2, 1936, at flowers of *Eriogonum fasciculatum* Benthem, collected by P. H. Timberlake. On Santa Catalina Island, in 1938, my wife and I collected it as follows: Avalon, June 5, many females; near road at Summit (highest point on the automobile road), September 1, at flowers of *Eriogonum giganteum* Watson, both sexes; Pebbly Beach, June 4, females; Cape Canyon, at flowers of *Opuntia littoralis* (Engelm.), both sexes; Fisherman's Cove, June 9, at flowers of *Calochortus* and *Sinapis*. The description of the female is made from a specimen collected at Avalon, June 5.

In a manuscript table of Californian *Colletes* the female is distinguished by the absence of black hair on thorax above, the bright tawny yellow hair of head and thorax, and the very distinct abdominal bands. The male is distinguished from all others by the abdominal structures.

The House Centipede (Scutigera forceps Raf.) in Washington

A specimen of *Scutigera forceps* Raf., the house centipede, was received recently from Yakima, Washington, taken in a warehouse. Several years ago an example of the same species was sent in from Spokane. The species thus apparently occurs at least in the eastern portion of the state, although perhaps only adventitiously.—Melville H. Hatch, University of Washington.

TWO NEW SPECIES OF PASADENUS

(Homoptera, Cicadellidæ)

BY R. H. BEAMER
*Lawrence, Kansas**

Pasadenus bicolor Beamer, new species

Resembling *P. margaritæ* Ball, but vertex much sharper, male plates extending but slightly past pygofers. Length: 5-5.5 mm.

Vertex flat, slightly more than a right angle, rounded to face. Elytra longer than abdomen, broadly rounded, flaring, but few more than typical number of cells in apices.

Color like that of *P. pasadenus*; vertex and anterior two-thirds of clavus ivory yellow; pronotum and scutellum dark; corium hyaline except broad band of fuscous bordering clavus and two crossbands, one near middle, the other at apex fuscous; venter yellow except middle portion of last ventral segment of female black.

Genitalia: Last ventral segment of female about three times as long as preceding, with lateral angles broadly rounding to mediumly deep excavated middle portion. Valve of male obtusely angled; plates narrower at base than valve, almost twice as long as wide, but slightly narrowed at apices, tips turned up, inner margin ending in black spine; pygofer almost as long as plates, a very small spine on dorsal margin almost at tip, usually not visible until dissected; ædeagus in dorso-ventral view broad at base, narrowing to outer third, widening into flat spade-like apex with retrorse process on either side as long as width of shaft at narrowest place, another shorter, outward-projecting spine at each outer corner.

Holotype male, allotype female, and 15 pairs of paratypes, Idyllwild, San Jacinto Mountains, California, July 29-30, 1938, R. H. Beamer. Swept from *Arctostaphylos pringlei drupacea* Parry. Types in Snow Entomological Collection, Lawrence, Kansas. Specimens are at hand from the same locality, but taken from *A. glandulosa* and also from Mt. Springs, California, taken from *A. glauca.* These vary slightly from the types in the internal structures.

Pasadenus anzanus Beamer, new species

Resembling *P. margaritæ* Ball but vertex definitely sharper, plates of male diverging on inner margin at apices and ædeagus

*Contribution from the Department of Entomology, University of Kansas.

with a long tube beyond the bifurcate lateral processes. Length, 6-6.5 mm.

Vertex sharp, slightly more than a right angle, disc flat; elytra quite reticulate on outer half.

Color ivory white marked with fuscous and lemon yellow. Vertex and basal two-thirds of clavus lemon yellow; pronotum and scutellum infuscated, band of irregular spots on anterior margin of pronotum darker; corium hyaline with median and apical brown cross bands, also broad brown border to clavus.

Genitalia: Last ventral segment of female about four times as long as preceding, posterior margin broadly bilobed with median notch about one-fourth as deep as length, with prominent median Y-shaped black mark. Male valve almost twice as long as preceding segment, broadly angular; plates narrower at base than valve, extending about half their length beyond pygofer, slightly separated on mesal margin, at base, and more so at tip, medium dorsally curving spine on inner margin at apex; pygofer almost lacking usual spine at tip, apices triangular, turned dorsally, ædeagus in dorsal view broad at base narrowing to outer third, widening into a pair of lateral bifurcate processes, the shorter turning basally, the other apically; duct extending on, much narrowed, with a pair of shorter lateral processes near tip, to end about even with other processes.

Holotype male, allotype female, six male and three female paratypes, Anza, California, July 29, 1938, R. H. Beamer and R. I. Sailer. Swept from *Arctostaphylos pungens* H.B.K.

THE ANOPHELES MACULIPENNIS COMPLEX OF WESTERN AMERICA

(Diptera, Culicidæ)

BY THOMAS H. G. AITKEN

University of California, Berkeley

Much controversy has been waged as to the exact status of *A. maculipennis* Meig. in North America. Studies carried on by the writer suggest the presence of three subspecies in our fauna. Typical *maculipennis* Meig. is considered not to occur in this country, because *occidentalis* (D.&K.), our only form resembling it in the silvery patch of scales at the wing apex, differs in having non-banded eggs and distinct terminalia. The two remaining forms, *aztecus* Hoff. and *freeborni* new subspecies, have unicolored wings.

Anopheles maculipennis freeborni Aitken, new subspecies

Female. Similar to *maculipennis*[1] except for unicolorous wing scales.

Male terminalia. External claspette spine acute.

Egg. Uniformly dark grey, unbanded, columellæ relatively far apart; floats smooth, 12-13 chambers.

Holotype, male, No. 4889, allotype, female, No. 4890, Calif. Acad. Sci., Ent., and 23 paratypes, "Davis, Calif. XI-6-37. T. Aitken."

Discussion. *Freeborni* differs from the European *maculipennis* complex[2] (*maculipennis*, *messeæ* Fall., *melanoon* Hack., *subalpinus* Hack. & Lew., *labranchiæ* Fall., *atroparvus* v. Th. and *elutus* Edw.) by its unicolored wings and unspotted eggs (exception *elutus*). In the egg of *elutus* the floats are rudimentary or wanting (cross-lined when present); the columellæ of the chorion (dorsum) in *freeborni* are small with relatively large intervening spaces, giving a dark effect.

The status of *occidentalis* in America has been greatly confused, due to the fact that the type series (U. S. N. M.) is a mixture. It includes at present 78 specimens; 64 (including type, No. 10,028) from Stanford University and one from Portland, Ore., are the true "silver-tipped" *occidentalis*; the others (Thrall and Sisson, Calif.; Portland, Ore.; Revelstoke, B. C.; Boise, Idaho; and Lehi, Utah) are all the unicolored inland form, *freeborni*.

Besides the "silver-tipped" wing, *occidentalis* has an egg similar to that of *freeborni*, but the columellæ are larger and closer together giving the egg a pale grey appearance. *Occidentalis* may have a predilection for impounded water in contrast to the fresh, irrigation water preference of *freeborni*. *Occidentalis* is restricted to a narrow strip along the west coast from the region of San Luis Obispo, Calif., north to the Canadian Northwest Territory and across the continent along the international boundary to New England. *Freeborni* occurs throughout those regions west of the Continental Divide, appearing on the coast in Southern California. *Aztecus*[3] is found in the Valley of Mexico. Like *freeborni* it has unicolored wings, but the egg has rough floats with 25 chambers. Its breeding habits appear to be different.

[1] Freeborn, S. B., Univ. of Calif. Publ. Ent., 3:448, 1926. (*freeborni* nec *maculipennis*).
[2] Hackett, L. W., Quart. Bull., Health Org., League of Nations, 6:1-16, 1937.
[3] Hoffmann, C. C., Anales del Inst. Biol. de Mex., 6:3-22, 1935.

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